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The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JAMES R. SHEATS, MARK K. HUESCHEN
and RONALD L. MOON

Appeal No. 2003-0116
Application No. 09/098,190

ON BRIEF

Before KRASS, DIXON and BARRY, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 3 and 8. Claims 4-7 and 9-12 have been indicated by the examiner as being directed to allowable subject matter and are not on appeal before us.

The invention is directed to a display using organic light emitting diodes (OLED). An array of isolation transistors is

formed on a substrate and this is kept separate from a flexible array of OLEDs until the time comes to connect the two.

Representative independent claim 3 is reproduced as follows:

3. A display comprising a plurality of light emitting pixels, each pixel comprising an isolation transistor, a driving circuit, and an organic light emitting diode (OLED), said driving circuit storing a value that determines the magnitude of the light emitted by that pixel, said driving circuit placing said OLED in a conducting path between first and second power terminals, said isolation transistor connecting said driving circuit to a bit line when said isolation transistor is placed in a conducting state by the application of a logic signal to a word line, wherein said OLEDs are part of a flexible array of OLEDs, said array of OLEDs comprising:

a flexible sheet having first and second surfaces, said first and second surfaces being parallel to one another, said flexible sheet being transparent to light of a first wavelength;

a first electrode comprising a first electrode layer in contact with said first surface, said first electrode layer being transparent to light of said first wavelength;

a light emitting layer comprising an organic polymer in electrical contact with said first electrode layer; and

a plurality of second electrodes, one such second electrode corresponding to each OLED, each of said second electrodes comprising an isolated conducting area in electrical contact with said light emitting layer, said light emitting layer generating light of said first wavelength in a region adjacent to said second electrode when a potential difference is applied across said first and second electrodes, and wherein said isolation transistors are part of an array of transistors on a substrate that is separate from said flexible array of OLEDs.

The examiner relies on the following references:

Bulovic et al. (Bulovic)	5,834,893	Nov. 10, 1998 (filed Dec. 23, 1996)
Gu et al. (Gu)	5,844,363	Dec. 01, 1998 (filed Jan. 23, 1997)
Jones	5,920,080	Jul. 06, 1999 (filed May 08, 1998)
Haskal et al. (Haskal)	5,952,778	Sep. 14, 1999 (filed Mar. 18, 1997)

Claims 3 and 8 stand rejected under 35 U.S.C. § 103. As evidence of obviousness, the examiner offers Jones and Gu with regard to claim 3, and Jones, Bulovic and Haskal with regard to claim 8.

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

OPINION

With regard to independent claim 3, the examiner points to Jones as disclosing the instant claimed subject matter (see the answer, pages 3-4) but for a flexible substrate array of OLEDs. The examiner turns to Gu for a teaching of flexible OLEDs, and concludes that it would have been obvious to utilize Gu's flexible OLEDs for Jones' substrate array of OLEDs, "so as to provide use as a light weight display device" (answer-page 4).

With regard to independent claim 8, the examiner applies Jones in the same manner as to claim 3, but the examiner relies

on Bulovic for the teaching of a flexible substrate array of OLEDs, wherein the OLEDs have sufficient flexure to allow each OLED to be connected to a corresponding one of the driving transistors when the array of OLEDs is pressed against the array of driving transistors (referring to column 2, lines 6-21). The examiner relies further on Haskal for a flexible sheet of a material being impermeable to water and oxygen (referring to column 3, lines 19-22). The examiner concludes that it would have been obvious "to utilize Haskal's impermeable sheet and Bulovic's flexible OLEDs as Jones' substrate array of OLEDs, so as to provide use as a resilient display device" (answer-page 5).

For their part, appellants argue that Jones does not disclose a display having separate OLED and transistor arrays because Jones' display "is constructed by depositing individual pixels on the transistor-containing substrate. The individual pixels are microcavities that are isolated from one another" (principal brief-page 3).

We do not find appellants' argument persuasive. While it may be that the instant disclosed invention is constructed by a different method than is the device in Jones, the instant claims 3 and 8 are not directed to a method of fabrication, but, rather, to a display structure.

It is true that both independent claims 3 and 8 require, "wherein said isolation transistors are part of an array of transistors on a substrate that is separate from said flexible array of OLEDs." However, Jones does disclose a substrate 100 (Figure 1); this substrate "may be a planar thin film transistor array..." (Column 7, lines 23-24); and the substrate 100 is separate from the array of OLEDs (see layer 300 of Figure 1,) wherein layer 300 is a "light emitting organic material layer" (column 6, lines 45-46). Thus, it would appear that the only difference between the structure of Jones and the instant claimed structure is in the flexible nature of the OLED array. The examiner has explained why it would have been obvious to make the layer 300 in Jones flexible, in view of Gu's teaching of such a flexible array of OLEDs and it is our view that the examiner's position appears reasonable.

While we understand that appellants provide for separate arrays of transistors and OLEDs and then join them together at a later time, while Jones makes the complete device by starting with a substrate 100 comprising an array of transistors, placing a first conductor layer 200 thereon and then placing the OLEDs on top of the conducting layer, in addition to some other steps, the instant claims do not provide for this difference in fabrication.

As claimed, Jones provides for "wherein said isolation transistors are part of an array of transistors on a substrate that is separate from said flexible array of OLEDs."

Appellants argue that while the fabrication specifics may not be specifically claimed, "[i]f one of ordinary skill in the art cannot make the device suggested by combining the references, then the combination does not render the claim in question obvious" [reply brief-page 2]. Appellants' error in this observation is that it is not appellants' "device" that is the focus, but, rather, the "*claimed* device." Since the manner of fabrication is not part of the instant claims, and the combination of Jones and Gu does, in our view, suggest the instant claimed structure, the examiner has made a proper combination under 35 U.S.C. § 103.

Appellants argue that the examiner has presented an erroneous motivation for combining the Jones and Gu references because the Jones device is inherently lighter than the display obtained by bonding a flexible display as taught by Gu to a transistor array as taught by Jones and, so, the artisan would not have sought to take Gu's teaching and apply it to Jones' device. We disagree.

Whether a device, as a whole, would be heavier or lighter, the teachings of the references would clearly have suggested to the artisan that the OLED array in Jones may be made flexible as it was known in the art to have flexible OLEDs (column 1, lines 16-17, of Gu) in order to have a "highly advantageous flexibility that enables them to be used for light weight, portable, roll-up displays or to be used for comfortable displays which can be readily attached to windows, windshields or instrument panels that may have curved surfaces" (column 1, lines 33-37, of Gu). Thus, being light weight is not the only reason one might have employed Gu's teaching of a flexible array of OLEDs. Gu provides other reasons, i.e., "comfortable displays...".

Accordingly, appellants' argument that the combination would provide for a heavier device than that which is already provided for by Jones is not persuasive.

With regard to appellants' argument about no teaching as to how one would bond an OLED array constructed from Gu's elements to the transistor substrate of Jones, the test of obviousness is not whether features of a secondary reference may be bodily incorporated into primary reference's structure, nor whether claimed invention is expressly suggested in any one or all of references; rather, the test is what the combined teachings of

the references would have suggested to those of ordinary skill in the art. In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant case, the combined teachings of Jones and Gu would clearly have suggested the instant *claimed* structure.

Accordingly, the rejection of claim 3 under 35 U.S.C. § 103 is sustained.

With regard to independent claim 8, appellants contend that Bulovic does not discuss the thickness or composition of the polystyrene, so that one cannot determine the degree of flexibility or light transmission (principal brief-page 5). According to appellants, Bulovic does not emit light through the substrate so one cannot tell anything about the light transmissive properties of the substrate with respect to the light generated by the device, and, polystyrene is not impermeable to oxygen and water.

We, again, do not find appellants' arguments convincing. While appellants argue that the reference does not discuss certain parameters of the materials used, so that one cannot determine the *degree* of flexibility or light transmission, instant claim 8 does not claim any particular *degree* of flexibility (only that the sheet be flexible) or light transmission (only that the flexible sheet be transparent to

light of a first wavelength). Bulovic clearly discloses that the substrate containing the OLEDs (or inverted OLEDs (IOLED) in Bulovic) may be "flexible" and "transparent" at column 3, lines 29-30.

With regard to the impermeability issue, the examiner relied on Haskal for this teaching (citing column 3, lines 19-21,) wherein the substrate is disclosed as "glass quartz or a polymer substrate such as polyethylene terephthalate or polyvinyl acetate." Appellants contend that glass quartz, while possibly impermeable to oxygen and water, is clearly not a "flexible" material. Then, appellants argue that while polyethylene terephthalate or polyvinyl acetate may be flexible, the reference does not indicate the "level of flexibility of these substances" nor does the reference indicate the "level of oxygen and moisture permeability of these materials" (principal brief-page 5).

Again, appellants' arguments are unconvincing because they argue limitations not in the instant claim. Instant claim 8 says nothing about the *level* of flexibility or the *level* of oxygen and moisture permeability, so, to say that the reference teaches nothing about the *level* of these properties is irrelevant as far as instant claim 8 is concerned. Clearly, since Bulovic teaches that the OLEDs are grown on a substrate which may be opaque or

transparent, flexible or rigid, or "composed of a wide variety of materials" (column 3, lines 31-32), and Haskal teaches that one choice may be a substrate material that is impermeable to oxygen and water, the artisan would have been led to make the substrate containing the OLEDs in Jones transparent, flexible and impermeable to water and oxygen since these properties are some of the obvious options taught by the prior art and they are clearly desirable options.

We would further note, as did the examiner, at page 8 of the answer, that appellants teach the same material, viz., polyethylene terephthalate, for the substrate as taught by Haskal (column 3, line 20), and yet appellants complain that Haskal does not disclose a *level* of flexibility and oxygen and moisture permeability. It appears incongruous for appellants to argue that the prior art does not perform the same function as appellants' device when the corresponding structures are composed of the very same material, i.e., both appellants and the prior art teach that the substrate for the OLEDs may be made of polyethylene terephthalate. Therefore, one would expect that the same properties regarding flexibility and impermeability to water and oxygen would exist in both structures, especially where the instant claims do not specify any dimensional information about

the substrate which might impose different characteristics while employing the same material.

With regard to appellants' argument that the OLEDs of Bulovic are designed to be fabricated on the substrate containing the driving circuitry as individual separate devices, we note that Bulovic is applied in combination with Jones (as well as Haskal) and, as discussed above, Jones clearly describes *separate* arrays of OLEDs and transistors, as broadly claimed. There is nothing in claim 8 regarding the specific fabrication of the claimed structural device.

Thus, we will sustain the rejection of claim 8 under 35 U.S.C. § 103.

The examiner's decision rejecting claims 3 and 8 under 35 U.S.C. § 103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

ERROL A. KRASS
Administrative Patent Judge

JOSEPH L. DIXON
Administrative Patent Judge

LANCE LEONARD BARRY
Administrative Patent Judge

BOARD OF PATENT APPEALS AND INTERFERENCES

EK/RWK

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